Sirs:

May I offer a word of appreciation to Lawrence P. Lessing [SCIENTIFIC AMERICAN, April] for his fine tribute to Edwin H. Armstrong—one of the very few really creative pioneers in the field of radio. May I also thank Mr. Lessing for coming to Armstrong's defense again [SCIENTIFIC AMERICAN, July] against an adversary who could not refrain from attacking him once more when he is no longer here to defend himself.

Armstrong was my friend. I valued him as a clean, honest man. I admired him as a brilliant, creative genius. I respected him as a doughty fighter for his rights against strongly entrenched and powerful adversaries, with that fine spirit of independence that made our country great. He has fought a good fight.

I have carefully refrained from getting into that controversy, and I prefer to stay out of it now. Since Armstrong has gone across the Great Divide and the dust of battle has settled so that men can see more clearly, may I venture to suggest that Armstrong's adversary was not the first inventor of a regenerative feedback circuit, nor of a regenerative electrical oscillator.

May I cite two patents issued to me on August 28, 1906, on applications filed February 28, 1905, and November 14, 1905? They are numbered 829,447 and 829,934. One is for a method and the other for an apparatus. The titles are respectively: *Method of and Apparatus for Producing and Utilizing Undamped or Sustained Electrical Oscillations.* The first method claim is as follows:

"1. The method of producing electrical oscillations, consisting in exciting or controlling a field by the oscillations of an electrical oscillating circuit, electrically commutating energy by means of such field, and adding by such commutation increments of energy to such oscillating circuit."

If that is not regenerative electrical oscillation operating by a regenerative feedback circuit, what is it?

The specification explains clearly the principle and practice of regeneration. It states further: "This may be done . . . by the effect of an electrostatic field upon the discharge of cathode particles in a vacuum tube." That is aptly descriptive of the mode of operation employed in the thermionic vacuum tube.

Those patent claims are fundamental and they have never been attacked. They were acknowledged by substantially the entire radio and telephone industries and by the United States government by taking licenses thereunder.

Armstrong and I were both students at Columbia University under the eminent authority on electromagnetic theory—Professor Michael Idvorsky Pupin.

I can never forget the day when a large and distinguished company of engineers gathered together in New York to do homage to the man who laid the foundation of long-distance telephony by creating the loaded telephone line. When the great thinker rose to respond he brushed aside his own outstanding achievements in the fewest possible words and then told about two young men who had been his students. He leaned heavily on his cane and said affectionately: "They were two of my chickens."

Such is the simplicity of greathearted genius.

Such was the inspiration of Ed Armstrong and his friend.

FREDERICK K. VREELAND

Vreeland Laboratory
Vreeland Corporation
Mill Valley, Calif.